For all questions, answer E. "NOTA" means none of the above answers is correct.

Note that for the following problems,  is defined such that .

1. Simplify the product .

A)  B)  C)  D) 

E) NOTA

2. A geometric series has terms and . Find .



A)  B)  C)  D)  E) NOTA

3. Let denote the Fibonacci number. Evaluate the following sum:



A)  B)  C)  D)  E) NOTA

For questions 4-8 determine the convergence (divergence) of the given series.

4.



A) Converges Absolutely B) Converges Conditionally C) Diverges

D) Inconclusive E) NOTA

5. given



A) Converges Absolutely B) Converges Conditionally C) Diverges

D) Inconclusive E) NOTA

6. 

A) Converges Absolutely B) Converges Conditionally C) Diverges

D) Inconclusive E) NOTA

7.



A) Converges Absolutely B) Converges Conditionally C) Diverges

D) Inconclusive E) NOTA

8. 

A) Converges Absolutely B) Converges Conditionally C) Diverges

D) Inconclusive E) NOTA

9. Let . Evaluate .

A)  B)  C)  D)  E) NOTA

10. Given a differentiable function , determine the values of  such that the series  converges.

A)  B)  C)  D)  E) NOTA

11. Define for all . Find .

A)  B)  C)  D)  E) NOTA

12. Evaluate  .

A)  B)  C)  D)  E) NOTA

13. Determine the value of the following limit: .

A)  B) C) D) E) NOTA



14. Evaluate 

A)  B)  C)  D)  E) NOTA

15. Determine the interval of convergence of .

A)  B)  C)  D)  E) NOTA

16. Evaluate the sum 

A) 1 B) 3 C) 5 D) 7 E) NOTA

17. Find the sum of the coefficients of the terms up to degree 4 in the MacLaurin series of .

A)  B)  C)  D)  E) NOTA

18. Determine a Taylor Series about  for the following integral .

A) + C B) + C C)  + C



D) + C E) NOTA

19. Find the value of.

A)  B)  C)  D)  E) NOTA

20. Determine the common ratio of an infinite geometric series with first term  and sum .

A)  B)  C)  D)  E) NOTA

21. Find a power series, centered at , for .

A)  B)  C)  D)  E) NOTA



22. Given the sequence , for what value of  will  converge to ?

A)  B)  C)  D)  E) NOTA

23. Evaluate 

A)  B)  C)  D)  E) NOTA

24. The first 3 terms of the binomial expansion of  are

A)  B)  C)  D) 

E) NOTA

25. Evaluate .

A)  B)  C)  D)  E) NOTA

26. If the sequence is recursively defined by and  for then find .

A)  B  C)  D)  E) NOTA

27. Let . Evaluate the error if the first one hundred terms are used to approximate the summation.

A)  B)  C)  D)  E) NOTA

28. For what value of will  converge?



A) B) C)  D) 



E) NOTA

29. The coefficient of  in the Taylor expansion of about  is

A)  B)  C)  D)  E) NOTA

30. Evaluate 

A)  B)  C)  D)  E) NOTA